

**RECREATIONAL FISHERY MANAGEMENT PLAN
FOR
LAKE ANDES
NATIONAL WILDLIFE REFUGE
LAKE ANDES SOUTH DAKOTA**



**PREPARED BY THE U.S. FISH AND WILDLIFE SERVICE
GREAT PLAINS FISH AND WILDLIFE ASSISTANCE OFFICE
PIERRE SOUTH DAKOTA
JANUARY 1996**

RECREATIONAL FISHERY MANAGEMENT PLAN

LAKE ANDES NATIONAL WILDLIFE REFUGE LAKE ANDES, SOUTH DAKOTA

Prepared by: Wayne Stancill Date: 1/11/96
(Fish and Wildlife Biologist)

Submitted by: Julia B. Pizzi Date: 2/29/96
(Refuge Manager)

Concurrence: Marion B. Wright Date: 3/28/96
(Fisheries and Refuges Supervisor)

Approved by: [Signature] Date: 4/3/96
(Assistant Regional Director)

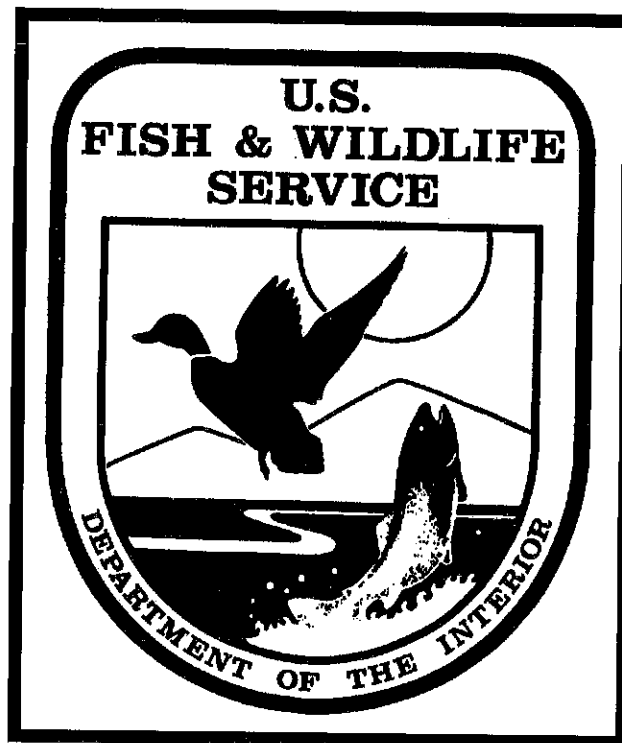
RECREATIONAL FISHERY MANAGEMENT PLAN

FOR

LAKE ANDES

NATIONAL WILDLIFE REFUGE

LAKE ANDES SOUTH DAKOTA



PREPARED BY THE U.S. FISH AND WILDLIFE SERVICE
GREAT PLAINS FISH AND WILDLIFE ASSISTANCE OFFICE
PIERRE SOUTH DAKOTA
JANUARY 1996

INTRODUCTION

Lake Andes National Wildlife Refuge, managed primarily for waterfowl production, is located in southeastern South Dakota, near the town of Lake Andes. The refuge has a 4,700 acre easement from the State of South Dakota that encompasses the entire lake bed. Fee title land, approximately 1,750 acres, is scattered around the northern and central portions of the lake (Fig. 1). Historically, Lake Andes was a much larger body of water. In 1922, Congress authorized the construction of an outlet structure which established a high water elevation of 1437.25 ft above mean sea level (msl), effectively lowering the lake water level by approximately 13 ft.

The lake's watershed is about 84,000 acres which is mainly agricultural cropland interspersed with prairie grasslands. At full pool, Lake Andes is approximately 4,180 surface acres, with an average depth of 3-4 ft. Most of the lake's water enters through Andes Creek on the north end of the lake with additional water entering the south unit via Owens Bay. Rainfall averages 22 inches per year, while evaporation averages 38 inches per year. Depending on annual precipitation, Lake Andes fluctuates from practically dry to completely full.

The lake is divided into three units (Fig. 1) by dikes which serve as county roads. Water control structures located in the two dikes were designed to keep water levels higher in the northern and southern units. Unfortunately, water supplies to the lake come mostly from the north, thus, negating the usefulness of the control structures.

The north unit is about 680 surface acres with a maximum depth of 10 ft. The center unit is about 1,900 surface acres with a maximum depth of 11 ft, and the south unit consists of approximately 1,710 surface acres (at full pool) with a maximum depth of 11 ft.

Lake Andes has a long history of providing recreational fishing. Fish stockings were initiated during the early 1900's and a renowned largemouth bass fishery developed and then declined. The lake is now classified as a "boom and bust fishery". Reduced lake levels, increased local irrigation demands, sedimentation, and eutrophication have all contributed to the decline in the lake's fishery. The last documented chemical renovation was in 1958; restocking began in 1959. After ample rainfall in 1962, the lake filled and provided quality fishing for several years. In the winter of 1964, a partial winterkill was observed and fishing declined. Since then numerous stockings have taken place, but the stockings have not produced a satisfactory fishery.

The Lake Andes fishery can be considered a boom or bust fishery. The lake provides exceptional fishing for a period during high water levels then the quality of the fishery declines, or worse, low precipitation and declining water levels result in fish kills. Unfortunately, most fishermen only remember the boom years and would like a fishery maintained as such. Without a constant source of flowing water, the lake level fluctuates

depending upon the amount of annual precipitation that occurs. The fluctuating water levels are detrimental to most game fish species (e.g., largemouth bass, yellow perch, and northern pike), but less harmful to less desirable fish species (i.e., bullhead and carp). Rough fish usually dominant the lake after winter kills. Management of the fishery is, therefore, extremely difficult because the lake can go completely dry in the summer and is susceptible to winterkill as well.

The greatest potential to maintain a recreational fishery lies within the south unit of Lake Andes. This plan is directed towards the management of the south unit only.

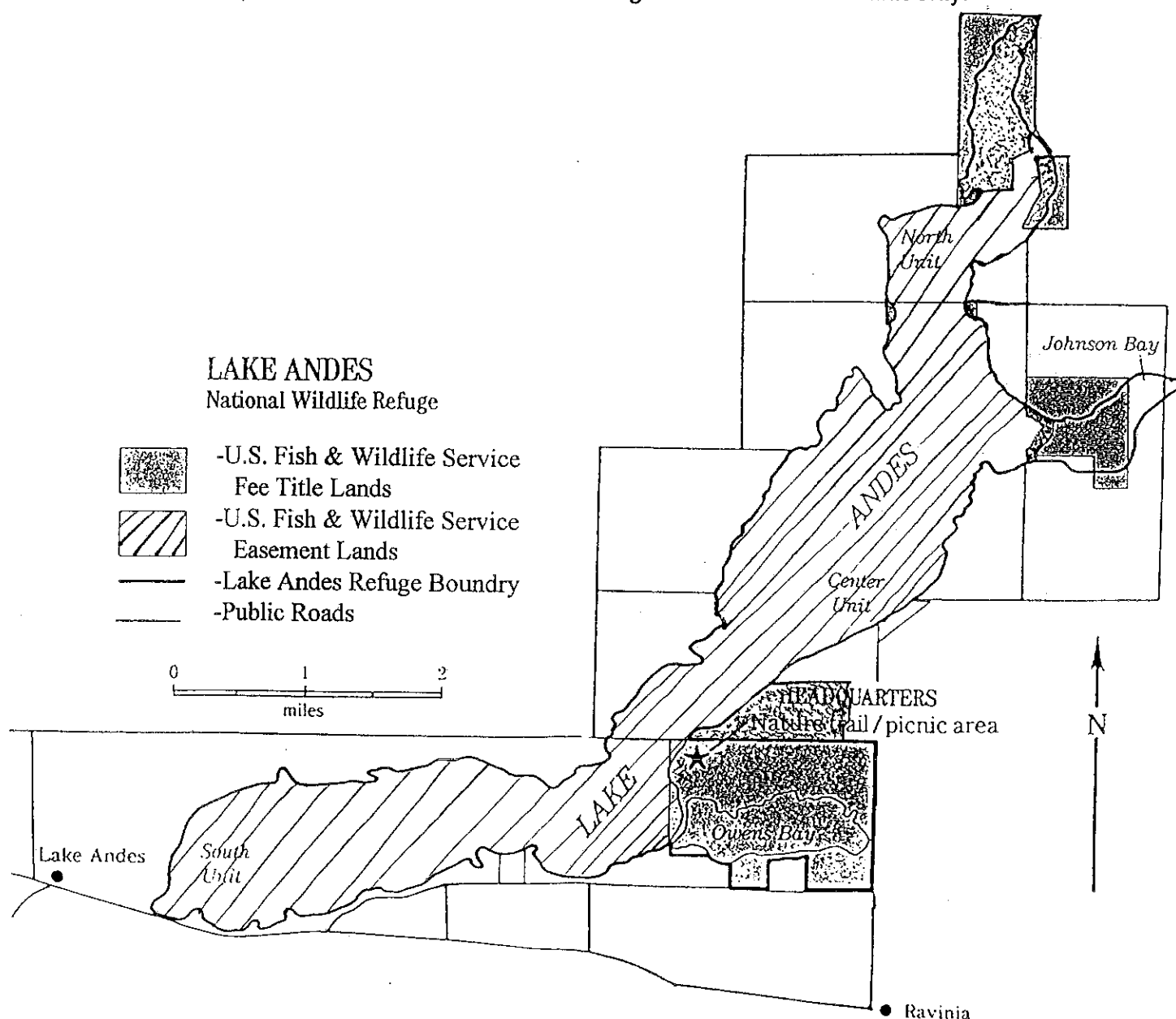


Figure 1. Map of Lake Andes National Wildlife Refuge

LAKE ANDES (South Unit)

The south unit of Lake Andes is located on the eastern edge of the town of Lake Andes. Several residential dwellings are located along the shoreline of this unit. The main control structure that lowered the lake level approximately 13 ft from its historic maximum elevation lies in the southwestern corner of this unit. The stop log bay in the main control structure is designed to hold water to an elevation of 1437.25 ft msl. With all of the stop logs removed, this structure has a flow line at 1433.25 ft msl. This flow line is several feet higher than the bottom elevation of the lake. The south unit is separated from the center unit by a county road that serves as a dike. There is a water control structure in the dike which was originally designed to pass water from the south unit to the center unit. The flow line of this structure is about 1430.5 ft msl. The top of the stop log bay in the center structure is 1434.5 ft msl. With the south unit at full pool, the top of the water control structure between the south and center units is 2.75 feet under water. Movement of fish between the two units at any water level above 1434.5 ft msl is unobstructed.

The south unit is approximately 1,710 surface acres, at full pool, with an average depth of 3-4 ft and a maximum depth of 11 ft (Fig. 2). A Sedimentation Survey Report (completed February 1993) by the Division of Water Resources Management, Department of Environmental and Natural Resources, South Dakota showed the lake to have a mean depth of 3.10 ft at 1430.9 ft msl and a mean sediment depth of 4.68 ft. The bottom is made up primarily of organic muck which is slightly flocculent. Large rocks and boulders are present along the shoreline. The water is highly turbid due to the large number of rough fish (i.e., carp and bullhead). Submergent vegetation is absent due to high turbidity. Emergent vegetation is primarily cattail and limited to the shoreline.

Conductivity averages 3300 at 16°C. Total alkalinity is 136 ppm and phenolphthalein alkalinity is 0. The pH averaged 8; secchi disc readings average 0.5 ft.

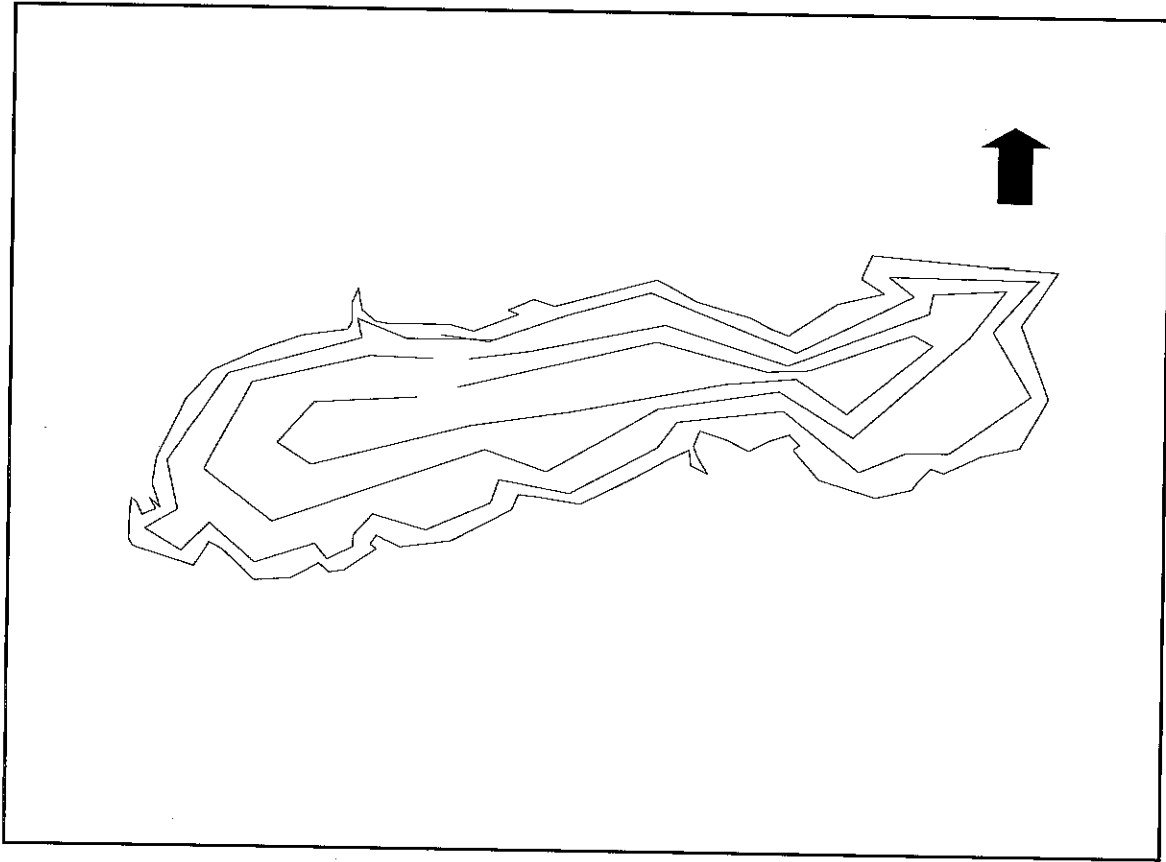


Figure 2. Contour map of Lake Andes (South Unit) at full pool.

The large numbers of carp and bullhead contribute to high turbidity which lowers light penetration and limits the amount of submergent vegetation. With no submergents, reproductive and nursery habitat of game fish (northern pike, yellow perch) is limited. If water quality could be improved a northern pike, yellow perch fishery could be maintained during high water periods. The northern pike and yellow perch are better able to withstand lower dissolved oxygen levels, therefore providing a fishery during low water levels.

Without a constant water supply and the eradication of the rough fish, the fishery in Lake Andes will continue to be marginal at best. Several alternatives to improve water quality include: 1) Introduce adult northern pike into the lake as a means of controlling carp recruitment; 2) Renovating the entire lake and watershed; 3) Installing rotary screens at the control structures including the inlet of Andes Creek; 4) Dredging the South Unit; and/or 5) Obtain congressional approval to raise the lake up to the original elevation of 1450 ft above msl.

LAKE ANDES RECREATIONAL FISHERY MANAGEMENT PLAN

Fisheries management activities will be a coordinated effort between the U.S. Fish and Wildlife Service and South Dakota Game, Fish, and Parks with input from the local citizens. An annual meeting will be held in the vicinity of Lake Andes to discuss current lake and fisheries conditions, exchange information, and develop strategies.

Recreational fishery management activities will be directed towards the south unit of Lake Andes which has the greatest potential for maintaining a fishery. The primary objective of the fishery management plan is to improved the water quality for the benefit of more desirable game fish species. Improvement of the water quality in the lake will also benefit other wildlife species as well.

Both agencies will pursue grants and other funding resources to improve the fisheries. Priorities will be given to developing fish barriers between the center and south units, rough fish control, water quality improvement in the water shed, and developing a reliable water supply.

Northern pike and yellow perch will be stocked during 1995 and 1996. Northern pike will be stocked from either state or federal hatcheries (or both). Yellow perch brood stock will be transplanted from South Dakota Lakes. South Dakota Game, Fish, and Parks will be responsible for identifying a brood source, but both agencies will assist in the transplanting effort.

The south unit will be resurveyed during the fall of 1996 to assess stocking success and develop future alternatives.

Commercial harvest will be used to help control rough fish when their abundance and size warrants and it is deemed profitable for commercial interests. South Dakota Game, Fish & Parks will handle the permitting after consulting with Refuge staff.

